WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device, comprising the steps of:

forming a gate on a predetermined area of a semiconductor substrate, forming spacers on side walls thereof, and then forming a junction area in a predetermined area of the semiconductor substrate;

forming a cobalt film and a buffer layer on the whole structure;

forming a cobalt mono-silicide film on the gate and the junction area, by performing a first RTP process;

making a surface of the cobalt mono-silicide film amorphous to form an amorphous cobalt silicide film, by performing a carbon ion implanting process; and

forming a cobalt di-silicide film, by removing the non-reacting cobalt film and the buffer layer and then performing a second RTP process.

2. A method of manufacturing a semiconductor device according to claim 1, wherein the cobalt film is formed to have a thickness of 70Å to 150Å, by keeping a reacting furnace, which initially maintains a pressure of 1×10^{-7} to 1×10^{-8} Torr, in 1×10^{-2} to 1×10^{-4} Torr and at from a normal temperature to a temperature of 550°C, and by using any one of a DC sputtering method, an RF sputtering method and a CVD method.

3. A method of manufacturing a semiconductor device according to claim 1, wherein the buffer layer is a TiN film.

4. A method of manufacturing a semiconductor device according to claim 3, wherein the TiN film is formed to have a thickness of 100 Å to 500 Å, by keeping a reacting furnace, which initially maintains a pressure of 1×10^{-7} to 1×10^{-8} Torr, in 1×10^{2} to 1×10^{4} Torr and at from a normal temperature to a temperature of 400°C, and by using any one of a DC sputtering method, an RF sputtering method and a CVD method.

5. A method of manufacturing a semiconductor device according to claim 1, wherein the first RTP process is performed at a temperature of 430°C to 530°C for a time of 10 to 60 seconds, by introducing nitrogen gas, argon gas, helium gas and hydrogen gas at a flow rate of 10 to 1000sccm, respectively.

6. A method of manufacturing a semiconductor device according to claim 1, wherein the carbon ion implanting process is performed up to a depth of 50 Å to 1000 Å with an energy of 10 to 100keV and a dose of 1×10^{14} to 1×10^{16} atoms/cm^2.

7. A method of manufacturing a semiconductor device according to claim 1, wherein the second RTP process is performed at a temperature of 650°C to 800°C for a time of 5 to 30 seconds, by introducing nitrogen gas, argon gas, helium gas and hydrogen gas at a flow rate of 10 to 1000sccm, respectively.

8. A method of manufacturing a semiconductor device, comprising the steps of:

forming a gate on a predetermined area of a semiconductor substrate, forming spacers on side walls thereof, and then forming a junction area in a predetermined area of the semiconductor substrate;

forming an insulating film on the whole structure and then removing the insulating film on an area in which a silicide film should be formed;

forming a cobalt film and a TiN film on the whole structure;

making the cobalt film react with the gate and the junction area from which the insulating film is removed and exposed, to form a cobalt mono-silicide film, by performing a first RTP process;

making a surface of the cobalt mono-silicide film amorphous to form an amorphous cobalt silicide film, by performing a carbon ion implanting process; and

forming a cobalt di-silicide film, by removing the non-reacting cobalt film and the TiN film and then performing a second RTP process.